Dr Ryan Madden, Program Manager at DTRA, and Christopher Russell, Program Manager from the DHS tell *CBRNe World* about ensuring that their prized possessions don't weigh them down…

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GW: How would you summarize the project and its findings from traditional agent release/fate programs?
RM: The premise of the IBRD (pronounced I-Bird, Ed. Interagency Biological Restoration Demonstration) exercise was that a wide-area biological attack (similar to the one presented in National Planning Scenario #2 'Biological Attack – Aerosol Anthrax') could significantly challenge the ability of a large urban area to maintain long-term viability. Thus, the goal of IBRD was to analyze and reduce the time and resources necessary to recover and restore wide urban areas, military installations, and critical infrastructure following a biological incident.
Specific program objectives were to:
– Understand the past and present social, economic, and operational interdependencies that impact recovery and restoration actions.
– Establish a long term formal coordination between the Department of Defense (DoD) and the Department of Homeland Security (DHS), and how this level of coordination can be optimized for stakeholder's use at the state, regional, and local levels.
– Develop strategic restoration plans for DoD and DHS that can be utilized in other parts of the nation.
Identify & demonstrate technologies that support recovery and restoration operations.
– Exercise restoration activities & available technology solutions.

Key results of the program include a baseline systems analysis, which established the 'as is' or current state of national recovery capabilities and methods, and identified an initial timeline for wide-area restoration at more than 10 years. Additionally, community resilience efforts identified that standard property leases allow for tenants to walk away from their property after six months of unavailable access; this highlighted the need for more innovative approaches to recovery capabilities. IBRD developed regional and national consequence management guidance that identified and described multiple approaches to remediation (including community self-decontamination) and risk based approaches for characterization, decontamination, and clearance. Further, the program identified/developed science and technology (S&T) solutions that are expected to significantly reduce the timeline for recovery from a wide-area biological attack. Specific solutions include civilian/military compatible information management toolsets, wide-area decontamination solutions and application devices, sampling efficiency improvements, and detection technologies.

Upon conclusion of IBRD, the following 'next steps' are underway or planned:

DHS S&T Directorate () led Wide Area Recovery and Resiliency Program (WARRP): WARRP takes the same goals and objectives to a second city, Denver, Colorado. Working with the Denver Urban Area Security Initiative (UASI), WARRP also broadens the scenarios it will examine to include chemical, biological, and radiological foci. DoD will maintain a supporting role in this new program.
DoD's Defense Threat Reduction Agency (DTRA) led Transatlantic Collaborative Biological Resiliency Demonstration (TaCBRD), will take place in the US European Command Area of Responsibility. This program will work with a yet to be determined partner nation(s) and includes interagency collaboration with the Department of State and DHS S&T.
DHS and Environmental Protection Agency (EPA) co-sponsored Biological Operation Test and Evaluation program, focused on individual building decontamination and clearance following biological contamination that will include Health and Human Services (Centers for Disease Control and Prevention [CDC]) and FBI involvement.

GW: One of the things that I liked about IBRD was the embracing of some socio-economic problems. Where do you stop with this, where is the natural limit?
CR: Socio-economic issues will likely be specific to the area affected. In Seattle, for example, one concern was how closing down the ports of Seattle and Tacoma would impact the region's and the nation's economy. Ports of entry and critical infrastructure are of constant concern to both DOD and DHS and represent key enablers to regions and the nation. So while national level consequence management guidance may not be able to provide detailed information on the potential socio-economic impacts of an event, it can identify planning considerations that local/regional governments can use to tailor their plans.

GW: Much of the impact of the attack comes in the immediate aftermath. While there were some S&T tools devised to reduce recovery timelines, what work was done to try and develop socio-psychological factors that might reduce the impact?
RM: One of the objectives of IBRD was to gain a better understanding of the social and economic aspects in the consequence management phase of a biological event. One area explored by the program was the importance of getting accurate and consistent messages to the public. To this end, the program held workshops on the increasing use and importance of social media (Facebook, Twitter etc.), during an event. The program also put together some 'Frequently Asked Questions' and other guidance which could be rapidly pushed to the media and websites to help the public understand what they should know about anthrax. By actively pushing information out quickly to the public, it will reassure them that the government is working to address their concerns and thus reduce the socio-psychological impact of a terrorist event.

CR: Additionally, over the course of the program it became evident that instead of pursuing a quantitative answer to 'how clean is clean?' it might be more appropriate to use a risk-based approach to answer that question. Current views of risk and the establishment of risk based clearance decisions related to Bacillus anthracis reflect a mix of scientific, social (public perception), bureaucratic (regulatory and legal), and practical (cost and time) considerations. Put another way, the goal of risk management is scientifically sound, cost effective, and integrated actions that reduce or prevent risks while taking into account social, cultural, ethical, political, economic, and legal considerations.

We had multiple strands of activity:
Reports:
– Financial Support for Private Sector after an Anthrax Attack: This document briefly summarizes the two primary mechanisms for providing financial support following a catastrophic event — the Stafford Act and the Terrorism Risk Insurance Act, describing how they would apply to the private sector in an anthrax terrorism incident.
– Owner/Occupant Performed Decontamination

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Using Common Liquid Sporicidal Materials: This handbook provides owners/occupants with a simple method to decontaminate a building or area following a *Bacillus anthracis* wide-area release using liquid sporicidal decontamination materials, and resources to hire a licensed contractor.
– Economic Impacts of a Wide-Area Release of Anthrax: This task further explores the economic impacts that might result from a wide area release of anthrax. The intent is not to provide a quantitative analysis of such a disaster, but to define the general categories of economic impacts that the region should be concerned about; and explore the types of private sector businesses or industries, if any, that may have the greatest impact on speeding the economic recovery of the region.
– Workshop After Action Reports:

Community Resiliency Workshops on Private Sector and Property Owner Requirements for Recovery and Restoration from a Disaster: The purpose of this set of workshops was to assess private sector readiness to restore property and recover business operations and to understand what businesses and private property owners 'want and need' from federal, state, and local government to support recovery and restoration from a disaster.
– Catastrophic Incident Recovery – Long-Term Recovery from an Anthrax Event Symposium: This day-long symposium was aimed at generating a dialogue about restoration and recovery and associated challenges that impact entire communities; including people, infrastructure, and critical systems.
– Social Networking for Emergency Management and Public Safety: The objective of this workshop was to showcase ways social media networking technologies can be used to support emergency management and public safety operations.

GW: What work, can be done on the six month lease issue - presumably businesses can't be coerced to stay?
CR: The goal in this situation would be to incentivize existing businesses to stay in the area or temporarily relocate and return when it is safe to do so, or to encourage new businesses to come to the area. Regional and national consequence management guidance developed by IBRD addressed these issues, and some of the considerations/policy issues identified are:

– Possible incentives that will retain businesses in the region, including mitigation measures to move businesses to other, unaffected parts of the region.
– The use of incentives to support the expansion or maintenance of existing critical economic infrastructure in alternate locations.
– The modification of growth management plans to support recovery goals.
– Evaluating how land use and repurposing decisions will be made and by whom.
– Recognition that while getting a population to return to an affected area is important, it can also be accomplished by bringing businesses, and thus workers, into the area.
– The identification of 'safety nets' and relief in the event a business returns to an area and fails.
– Incentives to promote tourism, trade, and hosting of business and government meetings to promote an image of a healthy, functioning area and bring 'outside' money into the region.

GW: Did IBRD provide any insight into the crisis management phase? I.e., if certain key actions are performed early (whether a re-evaluation of what critical infrastructure needs to be decontaminated or an understanding of local government actions) then the consequence management phase becomes easier.
RM: First, it is important to state that IBRD was built to attack the problem of a wide area recovery effort weeks into the event. Much time and money has been dedicated to notification and first response, but little focus has been placed on the next phases of long term recovery.

Having stated that, early on in IBRD it was realized that there is no clear delineation between the crisis and consequence management phases of an event and that response activities will significantly influence subsequent activities. Therefore, the Interim Consequence Management Guidance for a Wide-Area Biological Attack addresses response issues in the context of how they affect recovery. For example, accurate identification and initial characterization of the affected areas to determine the scope and type of contamination during the crisis period of an event will greatly affect the efficiency of remediation efforts. Furthermore, implementing effective mass prophylaxis and public messaging strategies during the crisis management phase will also impact the consequence management phase.

Additionally, one of the lessons learned during IBRD was how important proper planning for all phases is to the overall success of incident management. Planning factors such as identifying critical infrastructure as well as response and recovery capabilities, and establishing key relationships between potential responders and decision makers (both vertically and horizontally) before an event occurs will aid in how smoothly incident management goes.

GW: How applicable was previous military research into some of the elements - viability agent, reaerosolization, agent transport models etc., - especially when it is considered that anthrax is a classic BWA of which there is a large body of research (Amerithrax, Gruinard, etc.).
RM: While it is true that the military is generally recognized as the historic expert on BWAs, in recent years, government agencies and academic institutions have also devoted considerable effort into researching this issue. IBRD reached out not only to the military but also experts at the EPA, CDC, DOE National Laboratories, and universities such as Johns Hopkins Applied Physics Laboratory for their insight and expert evaluation.

To this end, the first year of IBRD was spent primarily on the performance of a systems analysis, which documented the then current state of US recovery and restoration capabilities, identifying possible gaps/chokepoints. Part of the data collection for the systems analysis was a literature review of over 300 documents, including military policy and tactics, civilian plans, and legislation, US government funded studies, and exercise after action reports.

One of the gaps identified during the systems analysis was a lack of understanding about, and inability to measure, agent fate and transport. This has implications for the overall recovery process in that without this knowledge it is difficult to determine the health risk associated with a release, and to assess what level of clean-up is needed. To address this gap, IBRD funded a study on agent fate and transport (including building infiltration).

Additionally, as IBRD neared completion, an analysis of the potential for anthrax spores to reaerosolize (another gap identified in the IBRD systems analysis) was initiated at the request of DHS S&T and DoD Chemical Biological Defense Program. The first part of this study was an exhaustive literature review of primary and secondary sources, including formerly classified military studies. The outcome of this review/analysis is that reaerosolization is a possibility, but the actual risk associated with it has not been adequately quantified.

GW: How much of the WARRP, formerly I CBR RD, is directly applicable to IBRD? Presumably much of the socio-economic work remains relevant for at least the six month lease period - regardless of whether it is a radiological or chemical agent?
RM: WARRP will be heavily influenced by the work done in IBRD. Specifically, toolsets, S&T outcomes, and guidance/frameworks will be tested and evaluated for transportability to other US regions. Additionally, WARRP will continue to explore the interdependencies between civilian and military response/recovery activities, public health, and socio-economic issues.
CR: One of the outcomes of IBRD was that providing solutions/frameworks to the biological problem space was useful, but it is not enough. To that end, our partners (both in Seattle and Denver) have pushed us to provide solutions/frameworks in an 'all hazards' context, including developing approaches beyond biological events. Hence, we are attacking chemical, biological and radiological challenges within this 'all hazards' framework. An overlying goal of WARRP is to determine just how much of what was learned in Seattle, Washington during IBRD can be applied to

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other urban areas. We will take what we learned in Seattle, see what applies in Denver, and in the end develop a framework which can be used by all urban areas to help them develop and tailor their own recovery plans.

GW: How do you account for regional and national differences?
CR: The problems and solutions between WARRP and TaCBRD are remarkably similar. While we in the US look at things from a local/region to state to national response perspective, our partners in the European Union (EU) also look at the problem very similarly with one main difference, the EU has more of an economic connection than an operational connection. The EU, United Nations and Nato all will have a role in TaCBRD, which creates some interesting challenges.

As mentioned previously, each region/nation has its own unique characteristics, concerns and assets. The challenge for IBRD, WARRP and TaCBRD was to provide tools, processes and frameworks which were specific enough to deliver real solutions, but without being too rigid to lose its applicability. An example of this type of thought process was in the development of a methodology for prioritizing assets for remediation. The methodology helps planners to objectively identify critical infrastructure rather than telling them that hospitals should always be cleaned first, for example. Every region/nation is unique and locals understand their own region best. The framework approach used by our programs allows locals to build their own unique plans while providing insights into consideration that should be factored into the plan.

GW: What input are you expecting from DoD in terms of the Biological response Operational Test and Evaluation Program (BOTE)? Is this really a military tasking/mission, as there are already well-established military routines for thorough decontamination?
RM: The Department of Defense has an evolving role in BOTE. While Phase One of BOTE is focused on a cost/benefit analysis for low (amended bleach), medium (vaporous hydrogen peroxide), and high (chlorine dioxide) technical approaches, the outcomes will inform both the civilian and defense communities equally. Moreover, Phase Two is an interagency response to an event using the outputs of Phase One to inform the incident commander on which approaches to use to restore a building.

One of the key outputs of IBRD is that there is limited capacity to evaluate samples to determine the extent of contamination, or to determine if clearance goals have been achieved. While recovery on a single building may not require the use of military capabilities, one of the aims of BOTE is to be able to 'scale up' approaches to recover many buildings in a region or in the nation. To that end, response and recovery from a wide area attack will require all government solutions (including National Guard and active military assets). The outcomes of BOTE will also be leveraged in both of the IBRD (WARRP and TaCBRD) follow on projects.

GW: What level of legislative buy-in are you expecting, since much of the building clearance decontamination comes down to issues of how clean is clean?
CR: Information provided in BOTE will aid in better identifying risk based clean-up standards. Having stated that, in both WARRP and TaCBRD, we recognize that certain parts of the country or the world will have different perceptions and approaches to what is acceptable risk. We expect that in some locations or for certain facilities zero growth goals are still going to be required. The output of BOTE and the frameworks developed in both follow on programs will account for more holistic approaches that quantify costs and associated benefits in case of such events occurring. We have already seen a change in perception based on the 'drummer' anthrax cases in the northeast. When the government isn't writing blank checks, there appears to be a willingness to accept some form of risk in some facilities.

One of the challenges we face is appropriately educating both the operational and legislative communities about the problems we face in the field. The questions regarding environmental challenges need to be correlated with appropriate public health risks. Once we are able to quantify these risks in this manner, we can inform all concerns appropriately, and terms such as 'zero growth' will not be blanket responses to the public.

GW: What level of private industry contribution are you looking for in WARRP?
CR: A significant level of participation/contribution from private industry is expected in WARRP and we will assess the appropriate level in TaCBRD, depending on the rules/regulations of the partner country. An important problem we hope to tackle using private industry is the expansion of indoor/outdoor decontamination companies. Currently, this represents a large choke point in our ability to restore a region. We have been approached by mould and termite remediation companies about enabling them to take on other challenges such as biological remediation. Using private industry as a part of the solution is fundamental to timely recovery.

Another place where private industry is being engaged is from the building owners and operators. Resiliency for urban areas relies heavily upon these facility owners/operators and their ability to recover without government help. To that end, we are exploring building and airflow standards that can be employed to make buildings more resilient to these kinds of events. We are also providing technical guidance that can be provided to the owner/operators as well as to the tenants.

GW: What existing technology initiatives in DHS S&T, DTRA/JPEO CBD, will be trialled for WARRP?
RM: Much like IBRD, WARRP will perform a systems analysis to determine where S&T investments will be made. This is on-going and scheduled to be completed in the June/July timeframe. It is logical that we will be looking at fixatives for all three threats and the use of novel near-term decontamination approaches. One big success of the IBRD program was the interagency collaboration – DHS, DTRA and the EPA worked together to identify what projects and issues they would each tackle. Constant communication and coordination ensured that efforts were not being duplicated and that all agencies were able to leverage the successes individually. This interagency collaborative approach will be continued and expanded during WARRP and TaCBRD.

GW: How are you going to 'Operationalize' IBRD?
CM: IBRD materiel and non-materiel products are being transitioned to civilian and military operational elements. For example, the Interim Consequence Management Guidance for recovery from a Wide-Area Biological Attack has already been provided to DHS BioWatch cities, and other products are being transitioned to the EPA and DHS Office of Health Affairs. On the DoD side, decision support toolsets are already being integrated with the department's Decision Support System 5.0 and numerous other products are being transitioned to Programs of Record (PoRs) within Joint Project Manager Guardian and Joint Project Manager Protection. Through these PoRs, capabilities will eventually be provided directly to operators. Both WARRP and TaCBRD will be influenced by operator needs and will be focused on transition of capabilities to operators.

GW: Are you expecting anything to follow on from WARRP/TaCBRD?
RM: Though in the initial planning stages, DTRA is planning on following up TaCBRD with a similar program in the US Pacific Command (PACOM) Area of Responsibility.
CR: WARRP, in partnership with FEMA, plans to leverage grants and training money to enable the remaining UASIs in the country to develop their own 'all hazards' catastrophic planning framework. A list of capabilities and technologies will be added to the FEMA list so UASIs can procure these materiel solutions as needed.

GW: What are the timescales for completion?
RM: WARRP kicked off in Denver on 16th February 2011 and will run through the end of 2012. TaCBRD is scheduled to begin in Q1 FY 2012 and go through Q4 FY 2014. Andthe PACOM follow on effort is scheduled to begin in Q1 FY 2013 and finish in Q4 FY 2015.